MARINE REVIEW.

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World's Fair Passenger Steamer.

In a supplement accompanying this issue of the REVIEW there is presented a correct picture of the whaleback passenger steamer, Christopher Columbus, launched at West Superior, on Saturday last and intended for service on Lake Michigan, between Chicago and the grounds of the World's Columbian Exposition. The engraving is from a painting made by Howard F. Sprague, under the direction of Capt. Alex. McDougall, inventor of the whaleback type of vessel, and represents the steamer as she will appear when fully equipped.

Although built at the West Superior shipyard of the American Steel Barge Company and intended indirectly as an exhibit from that company at the fair, this boat will be owned by the Columbian Whaleback Steamship Company and intended indirectly as an exhibit from that company at the fair, this boat will be owned by the Columbian Whaleback Steamship Company and will be operated under charter by the World's Fair Steamship Company, two corporations entirely independent of the barge company.

The World's Fair Steamship Company, known also as the Henry syndicate of Chicago, has a contract with the directors of the fair to furnish transportation facilities by water to and from the fair (for 150,000 people daily, it is claimed), and the whaleback passenger steamer will be the greatest attraction among the boats thus engaged. Her trips will be between a pier in front of the Auditorium and the exposition buildings at Jackson park, a distance of seven miles. It is expected that the boat will be capable of carrying 5,000 excursion passengers at one time if required. She is intended entirely for excursion purposes and will have no state rooms. This is the first whaleback passenger steamer, and is a radical departure from any craft ever built to carry passengers. In appearance the hull differs little from that of the whaleback freight carrier, but above her main deck rise seven turrets, upon which the cabins are supported. The lines of the hull are fine, as the steamer is expected to be very fast, but the conical bow and rounded deck are common to all whalebacks.

The boat is of steel and is 362 feet over all, 42 feet beam and 24 feet deep. The seven turrets are elliptical in shape. The forward one, 19x13 feet, contains the windlass; turrets Nos. 2 and 3 are 26x18 and contain stairways to the saloon deck above and between decks below. No. 4 contains the smoke stacks, air fans and ash hoists. It contains also the entrance to the fire room and is 27x18. In the next turret aft, of the same size, is enclosed the engine room and machinery. The two after turrets contain stairways similar to those forward. There are four gangways on each side, by which passengers can enter and leave the ship. Upon the deck amidships are the dining and refreshment rooms and various booths. Forward are the kitchens and crew space. In the hold two stringers braced with face angles extend fore and aft. Outside are two 12-inch steel fenders. The flat keel is of 29 pound plate, and the shell for one-half of the length amidships is 24 pound, tapered to 18-pound plate at the ends. She has a double bottom extending fore and aft, 42 inches deep, giving a water ballast capacity of 730 tons. The compartments are built on the McIntyre principle with nine girders 3 feet apart, and braced with angle irons to the floor plates. There are nine watertight bulkheads, and in addition from her nose in the forepeak there extends a fore-and-aft bulkhead 42 feet long.

The saloon deck, supported by the turrets, is connected to the ventilator tubes with angle iron collars. The tubes are 12 feet apart and 9 inches in diameter. The entire saloon deck is given up to the grand saloon, 225 feet long and 30 feet wide. Aft is the ladies' cabin. The remaining room is entirely open and will be handsomely fitted and furnished. The saloon will be heated with steam and lighted with electricity, as will the vessel throughout. Outside the saloon will be a promenade deck 4 feet wide with 32 feet of clear space both fore and aft. This deck will be supported at the sides by the ventilator tubes, which will be decorated. Over the saloon is the promenade deck proper, which is 257 feet long, with a skylight 15x138 in the center. There are also glass dome skylights over both the fore and after stairways. On this deck are the captain's cabin, the wheelhouse and the officers' quarters.

A feature of the grand saloon, and indeed of the whole boat will be a splendid marble and glass fountain placed in the middle of the grand cabin. It is to be 6 feet in diameter at the base, and the principal portion of it will be a glass tank filled with water in which will be shown the various fish found in the great lakes, including the famous speckled trout. The water will be supplied by an electric motor and will be drawn from one of the water ballast compartments.

The engines now ready to be placed in the boat are from the works of S. F. Hodge & Co., of Detroit. They are triple expansion with cylinders 26, 42 and 70 inches by 42 inches stroke and are expected to develop nearly 3,000 horse power. Six Scotch type boilers, 11 feet in diameter and 12 feet long, built by the Cleveland Ship Building Company, will supply steam at a maximum pressure of 160 pounds. The propeller will be 14 feet in diameter with a pitch of 9 feet.

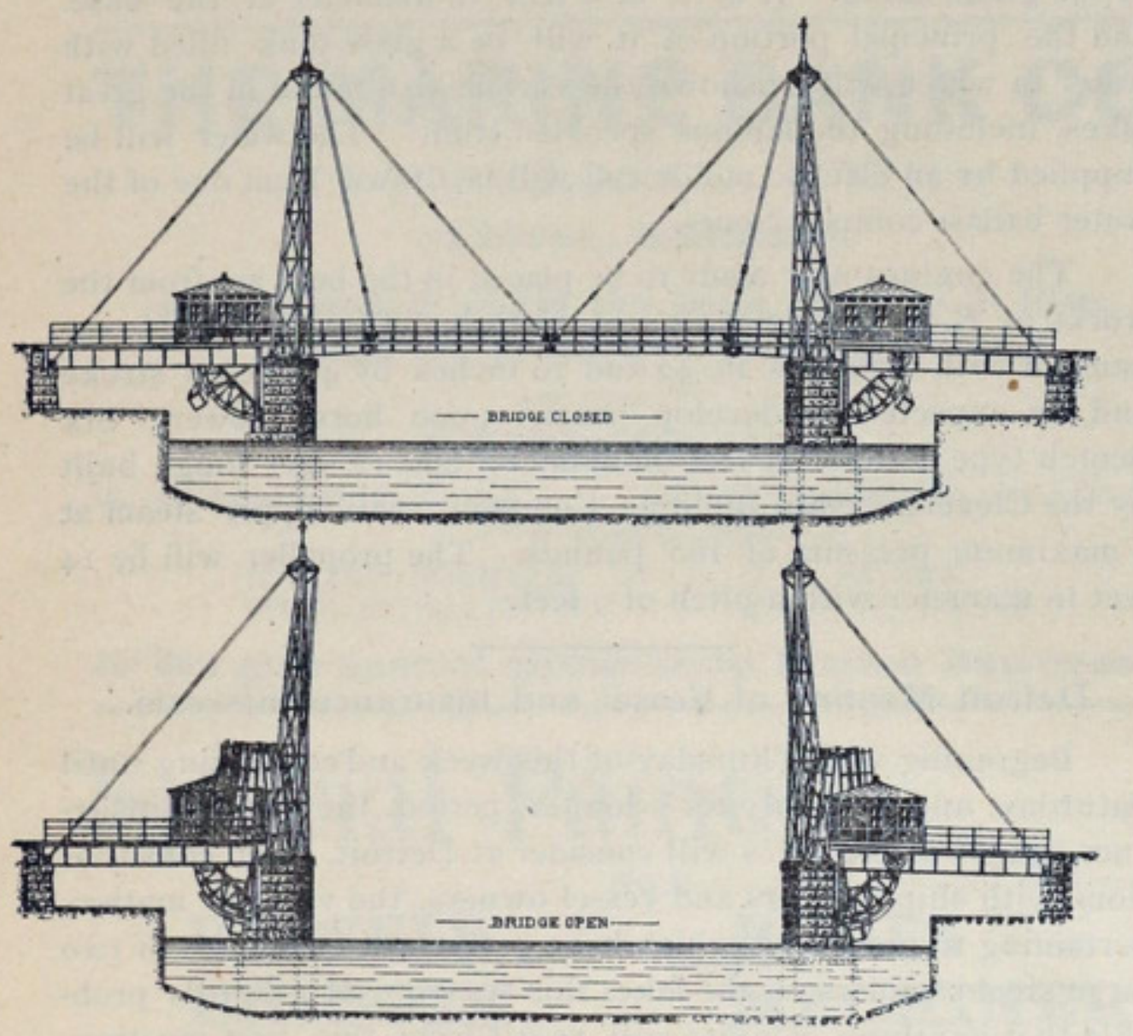
Detroit Meeting of Vessel and Insurance Interests.

Beginning with Thursday of this week and continuing until Saturday, and probably for a longer period, the general insurance agents of the lakes will consider at Detroit, after consultations with ship builders and vessel owners, the various matters pertaining to insurance, which have grown out of the loss of two large steel steamers on the lakes this season. It is hardly probable that anything definite will result from this first meeting. Certainly the agents themselves have no definite plans in going to the meeting, and it would be useless to repeat here any part of the vast amount of discussion that has attended the question of structural weakness in lake-built steamers. These general agents are all in favor of establishing, on a broader basis than that of the old Inland Lloyds, a local, or lake, association for the inspection and classification of lake vessels of all kinds, but how to combine the various interests for the maintenance of such an association is a very difficult question. The general agents are opposed to such classification societies as the American Ship Masters' Association and the Bureau Veritas of France, which organizations have already secured something of a foothold on the lakes, from the fact that a general classification of lake vessels by these associations will tend to divert more of the insurance business to foreign companies. Then, too, there is objection to the maintenance of an association on the lakes for classification purposes that would be of sufficient importance to have its rulings accepted by foreign underwriters, on the ground that this would also tend to increase the large portion of business already held by the foreigners. The question of demanding alterations in vessels already in commission is also an important one, and altogether the Detroit gathering will have a complicated task on hand at the outset.

New Forms of Bridges in Lake Harbor.

On account of the growing commerce of the lakes and the crowded condition of harbors and connecting channels, the question of constructing bridges that offer the least obstruction to navigation is receiving a great deal of attention. Since the passage, a short time ago, of the act giving to the secretary of war control of all navigable streams as regards the matter of bridges and other obstructions, railroad corporations and municipal authorities have been thwarted in efforts to erect bridges that were not acceptable to the war department, and as a result structures of various designs are proposed The bridge shown in the accompanying engraving is known as the Harman jack-knife, or folding bridge and is destined for the Chicago river at Canal street. The first bridge built under the Harman patent spans the Chicago river at Weed street, where the opening is 60 feet. The proposed Canal street bridge is to have a span of 80 feet. The detail of the bridge is as yet crude and clumsy, but it has been worked successfully.

In the December number of the Engineiring Magazine, from which the engraving is taken, Mr. T. Graham Gribble, civil engineer, describes the Harman bridge and discusses at some length the recent competition for a premium of $1,000 offered on plans



HARMAN LIFTING BRIDGE, CHICAGO RIVER.

for a bridge at Duluth, Minn. "The essential features of Harman's folding bridge are that it is a double-jointed bascule," says Mr. Gribble," in which the outer joint permits the outer end of the bridge to fall down and so to cause the whole bridge to fold back against the pier. The portion of the bridge which rises forms an effectual barrier to the traffic while the bridge is open. It requires less counterbalancing than the ordinary bascule, is not liable to interfere with ships' rigging, and offers no resistance to wind, being folded up within the pier. It gives a clear waterway in the middle of the stream, and, last but not least, it is an economical bridge. Messrs. Shailer and Schniglau of Chicago are the contractors, and the detail has been worked out by the engineer of the company. Considerable ingenuity is shown in arrangement of motive power and counterbalancing. Instead of the unsightly rack-sectors usually seen in bascules, the bridge is operated by a solid-link chain and sprocket wheel under the floor. The counterbalance instead of being hung at the end of the shore arm, is, as will be seen, attached lower down. This was necessary on account of the composite movement of the bridge. Unlike those of ordinary bascules, the leaves,when reaching a certain point, tend to close of their own accord. A position of counterbalance was obtained from kinetic diagrams,which would as nearly as possible correspond in its effect to the combined effect of the rising and falling flaps. Both of the Chicago bridges are designed for ordinary street traffic. The designers are prepared to adapt the bridge to railroad traffic and are confident of obtaining all the rigidity required. The fit of the ends is controlled by the outer forestay, but in addition a key will lock them together when closed. The tendency of the intermediate joint to knuckle up under a passing load is prevented by placing the center of the bridge and the two axles of rotation in one straight line. It can not be expected that a double-jointed bridge will be as rigid as one with a single joint, but it is still quite probable that the bridge may be adapted to railroad traffic and prove the best form for waterways of considerable width."

At Duluth no decision has been made as to the kind of bridge to be constructed, although the competition resulted in twelve designs being submitted. The conditions called for a span 250 feet, single railway track, two electric railway tracks, two highways, and two sidewalks. The premium offered was $1,000 and was awarded to Messrs. Arentz and Sangdahl for a single sliding draw-bridge, estimated to cost $236,000. It was decided afterwards that the cost was too great, and it was proposed to construct a lifting bridge designed by J. A. L. Waddell of Kansas City. The towers were 170 feet high, and the estimated cost was $125,000. Pontoon bridges were submitted by B. F. de la Rue and L. D. Grosvenor of Jackson, Mich.—one end pivoted the other on pontoon with propeller—estimate $108.000; similar construction by Onward Bates and J. N. Warrington of Chicago, estimate $80,000. Single swing bridges were submitted by T. A. McNicol of Providence, R. I., and double swings by E. B. Jennings, of Springfield, Mass. A double-sliding draw-bridge was submitted by Sooysmith & Co. of New York and Chicago.

May Result in the Building of War Vessels on the Lakes.

In accordance with a resolution passed at the last session of congress, the state department will shortly make a report relative to conditions which have prevented the building of vessels of war on the lakes. It is understood that the report will show that notice of abrogation of the treaty of 1817, in so far as it appertained to the number of vessels to be maintained by each country on the great lakes, was given under the act of 1866, but was immediately withdrawn because of complications then existing between the two countries. The report will develop some very interesting facts and correspondence on the subject, and will also bring before congress official reports demonstrating the ability of lake ship builders to compete with builders on the coast in the construction of certain kinds of war vessels, and in fact the very largest of them if the water outlet to the seaboard would admit of their passage.

Weakness in Deck on Account of Big Hatches.

A naval architect of New York, who was recently shown some drawings of a steel freight steamer built on the lakes, writes a Cleveland friend as follows: "The data you send me is not sufficient from which to make satisfactory computations, but in looking over the drawings the weak point to me seemed undoubtedly in the enormous hatches. Those caught my attention instantly, and I should expect that there, if anywhere, weakness would show itself. Nearly all of the deck is cut out, with little compensating material in deck or shear strakes in the wakes of the hatches."

Some builders are now strengthening new vessels in the parts to which the correspondent refers.

Marine Engineering at the Fair.

One of the divisions of the Engineering Congress, World's Columbian Exposition, will be devoted to marine and naval engineering and naval architecture. George W. Melville, engineer-in-chief of the United States navy, who is chairman of this division of the congress, says that preparations are not as yet entirely completed, but he anticipates a remarkably interesting series of meetings for the division, as there is assurance already of valuable papers from some of the most prominent marine engineers and naval architects both here at home and abroad.

MARINE REVIEW for one year and Patterson's Nautical Dictionary for $6.

Lake Carriers' Association.

M. A. BRADLEY, President.

VICE-PRESIDENTS: James W. Millen, Detroit, Mich. — John G. Keith, Chicago, Ill.
Frank J. Firth, Erie, Pa. — W. S. Brainard, Toledo, O.
Thomas Wilson, Cleveland, O. — R. P. Fitzgerald, Milwaukee, Wis.
Peter F. Miller, Buffalo, N.Y. — Alex. McDougall, Duluth, Minn.

Charles H. Keep, Secretary, Buffalo, N.Y. Geo. P. McKay, Treasurer, Cleveland, O.
Harvey D. Goulder, Counsel, Cleveland, O.

Secretary Charles H. Keep makes public the following report of the business transacted at a meeting in Buffalo on Saturday last by the committee on legislation:

First.—The secretary laid before the meeting a communication from the department of state showing a deadlock in the matter of reciprocal wrecking between Canada and the United States. This deadlock arises from the fact that the United States has so far insisted that such reciprocity of wrecking should extend to the canals, while Canada agrees to it in the lakes and connecting rivers, but not in her canals. The committee thought that the privilege of wrecking in the canals was unimportant, and that measures should be taken to introduce in congress a bill amending the former act concerning reciprocity of wrecking by striking out the words therein relating to the canals. The passage of such an amendatory act would enable the president of the United States to proclaim reciprocal wrecking on the lakes and connecting rivers at once.

Second.—The secretary was directed to endeavor to procure the passage of an act by congress directing the appointment of an official board to examine into the subject of raft towing on the great lakes and connecting rivers and to report to congress as to what restrictions, if any, should be made in the size and manner of towing such rafts. It was believed by the committee that such a report would bring the raft question before congress in such a form that relief could be obtained, and that without such official backing, action by congress could not be had.

Third.—The committee adopted resolutions requesting the committees on appropriations of the two houses of congress to provide in the proper appropriation bill the money recommended by Gen. Poe and Gen. Casey in their annual reports for examining and re-surveying certain dangerous localities on the lakes and correcting the lake charts accordingly. The resolutions of the committee are based upon the main proposition that the government of the United States should not sell to navigators incorrect and untrustworthy charts.

Fourth.—The committee unanimously recorded themselves as opposed to house bills 7,368 and 9,176 forbidding limitations of liability on bills of lading, and Vice-President Firth was requested to co-operate with the ocean steamship lines in opposing the passage of these measures. The grounds of such opposition will be found in a pamphlet upon this subject containing a letter transmitted to the house committee on commerce by Mr. Firth in July last. Copies of the pamphlet can very probably be secured by addressing Mr. F. J. Firth, president Erie & Western Transportation Company, Philadelphia, Pa.

Fifth.—The committee on legislation suggested to the committee on aids to navigation that there is a special need for a light-ship at Poe's reef, and that the association should make a strong effort to procure such an important aid to navigation at this winter's session of congress.

APPROPRIATIONS EXPECTED FROM THE PRESENT CONGRESS.

No effort will be made in the present session of congress to secure any new appropriations for river and harbor purposes, as Mr. Blanchard, chairman of river and harbor committee, has declared with other leaders in the house that no river and harbor bill will be considered. The sundry civil appropriation bill will, however, carry about $16,000,000 for continuing work on contract improvements authorized by the last two sessions of congress, which will include $2,500,000 for the Sault canal and Hay lake works and $1,000,000 for the 20-foot channel project between Chicago, Duluth and Buffalo.

Judging from the recommendations made to congress by Secretary Foster regarding light-houses, fog signals, etc., the light-house board is disposed to be more liberal to the lakes in the matter of such aids to navigation. Among the items in the general bill, for the passage of which a great effort was made in the last session, Secretary Foster reports the following as indispensable: Big bay point, light and fog signal station, $25,000; Chicago fair buoyage, $29,500; Chicago breakwater, light-station, $15,500; Escanaba, fog signal, $1,100; Fourteen-mile point, light and fog signal. $20,000; Grassy point, range lights, $8,000; Old Orchard shoal, light, $300; Oswego, fog signal, $4,300; patrol steamer for St. Mary's river, $4,000; Pere Marquette, fog signal, $5,500; St. Mary's river lights, $145,562; Seul Choix point, light station, $3,500; tender for the ninth light-house district, $95,000. The lake items in the board's recommendations, which the secretary considers necessary, are as follows: Ballard's reef, light and fog signal, $100,000; Cheboygan river, front range, light station, $1,750; supply depot for the ninth and eleventh districts, $15,000; Eagle harbor, fog signal, $5,500; Galloo island, fog signal, $5,700; Maumee bay, range lights, $4,100; Menosha, range lights, $500; Old Mackinac point, light station, $1,000; Peshtigo shoal, light and fog signal station, $10,000 Poe's reef, light-ship, $25,000; South Fox island, fog signal, $55,000; Tibbetts point, light station, $4,300; Wilson harbor, light station, $2,500. The rest of the items recommended by the board the secretary considers as only desirable and so recommends.

Advantages Claimed for High Stacks.

Advantages claimed by Engineer-in-Chief Melville for the smokestacks of 100 feet adopted for the new armored cruiser Brooklyn are as follows:

They enable a higher average speed to be steadily maintained without any special fittings. It has been estimated as the result of experience and experiment, that each ten feet of additional height increases the draught as much as one-eighth inch of water air pressure.

A very conservative estimate of the increased combustion due to one-half inch air pressure is 10 pounds per square foot. This makes the combustion with natural draught in the 100-foot pipe 25 pounds per square foot.

The effect of this in the armored cruiser Brooklyn with 1,016 square feet of grate surface is to give in round numbers 11,500 I. H. P., instead of 7,000 I. H. P., with the shorter pipe. As the cruising displacement is 9,100 tons, this means raising the sustained speed from 15.35 to 17.20 knots, or nearly two knots per hour.

The deleterious effect on the boiler, caused by the use of force draft, is avoided by the increased chimney draft. Hence the life of the boiler is prolonged, and there is also a saving in the cost of repairs. The high pipe will also produce an actual economy of combustion, due to the more energetic combination of the oxygen of the air with the fuel.

There is also the saving in the extra coal needed to run the blowers of nearly three tons per day; an increased combustion, due to one-half inch of water air pressure without requiring a single additional man to look after it. There is the further advantage that having already raised the steady cruising speed from 15.35 to 17.1 knots, if a small additional measure is wanted (say one knot) this can be obtained with a moderate increased air pressure from the blowers. The high pipe thus increases the speed without injury to anything; increases the life of the boiler; increases economy of combustion at moderate powers; saves coal lost by radiation from extra boilers with short pipes; saves in repairs to boilers; saves extra coal needed to run blowers.

Output of Mesaba Ore—The Ore Market.

Now that the most promising of the Mesaba range properties are fully prepared to ship some ore next season, there is considerable speculation as to the probable aggregate output and the effect of the new range on the market. At least eight mines are now represented by sales agents in Cleveland. They are: Cincinnati and Hale of the Standard Ore Company and New England and Weimer, controlled by Corrigan, Ives & Co., and represented by that company as sales agents; Biwabik and Ohio, controlled by P. L. Kimberly and represented by Tod, Stambaugh & Co.; Mountain Iron, represented by Oglebay, Norton & Co.; Canton, controlled by the Minnesota Iron Company and represented by Pickands, Mather & Co. The sales agents for all of these companies are already in the market, and in addition it is very probable that some ore will be produced by the Mesaba Mountain, owned by Henry W. Oliver, and by the Virginia, which is also reported to be controlled by Mr. Kimberly.

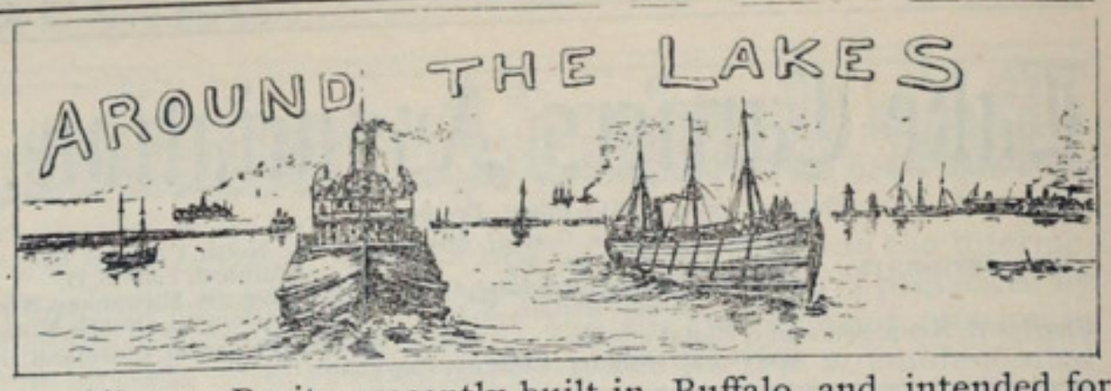
Still, the Cleveland agents who represent these mines are of the opinion that 500,000 tons is a fair estimate of the output of the new range for the first season. They do not underestimate the importance of the range as regards shipments following the next season, but in holding to the half million figure they take into consideration the disadvantages of opening up a new range even under the most favorable conditions, and hold also that were it possible to produce a million tons, the market would not stand that amount of new ore. Furnace men will not take the ore freely until it has been given a thorough trial and all questions as to quality fully settled.

In view of the present heavy consumption of iron ore, there is every reason to believe that sales will be made as early as usual, but the disposition among furnace owners to expect a big reduction in prices on account of the stories of an output of 1,000,000 tons or more from the Mesaba is a drawback to the market. Sales agents say that as a result of the inability of the promoters of the Mesaba to produce half what is claimed for the range during the season, furnace men who delay purchase will pay higher prices for their ore during June and July of next year. This is, of course, an argument in favor of the old mines, but the opinion that the Mesaba will not produce more than 500,000 tons seems well founded.

Legal Matters.

A decision handed down by the supreme court of the state of Wisconsin on Wednesday will prove of considerable interest, from the fact that it may have a bearing upon similar cases in other states. The Milwaukee Steamboat Company, doing business in the city of Milwaukee, had established an office outside the city in order to escape what was considered unreasonable taxation on its vessel property. Suit was begun, and after the case had gone to the court of last resort in the state, it was held that taxes could be collected in the city where the corporation was doing business. This may be good law, but it is hardly sound policy on the part of the municipal authorities of Milwaukee. This steamboat company is doing business at places other than Milwaukee where the tax system is more reasonable, and can, we have no doubt, find an expression of opinion even in this decision that will enable it to transfer the headquarters for its vessel property to several such places. Vessel property can be made a very uncertain commodity to the tax gatherer, but is a most important factor in the advancement of cities, and the municipality that pursues a liberal policy toward such property in the matter of taxation profits by it in the long run.

Judge Coxe, presiding in the United States circuit court at Utica, N. Y., on Tuesday divided damages in the case of the John Donaldson vs. the steamer Kate Buttironi. The case grew out of a collision on Lake Erie whereby the Buttironi ran into and badly damaged the steamer Cuba, owned by the libellant. George Clinton of Buffalo appeared for the Cuba and Harvey D. Goulder of Cleveland for the Buttironi.



The tug Puritan recently built in Buffalo and intended for fishing purposes at Dunkirk, N. Y., is 20.30 tons gross and 10.13 net. Her official number assigned by the bureau of navigation is 150,614.

It is again reported that the New York, Ontario & Western Railway running between Oswego and New York city, is figuring on establishing next season a line of lake steamers between Chicago and Oswego.

In the channel entrance to St. Joseph harbor, Lake Michigan, there is now from 16 to 17 feet of water, and unless there are some very severe storms from the northwest there is little danger of the channel filling up.

We regret that the Annie Falconer, owned by Thomas F. Taylor of Kingston, was, through error, included in the list of lost vessels published in the REVIEW last week. This boat met with no accident and is now in winter quarters at Kingston.

The big wooden steamer George G. Hadley, Capt. D. H. Mallory, now unloading hard coal at Toledo, carried thirty-three cargoes during the season just closed. She took sixteen cargoes from the head of Lake Superior, going up light only once.

It is said that Centurion will probably be the name of the fourth steel steamer put down this fall at the yards of F. W. Wheeler & Co., West Bay City, Mich. The yard number of the boat is 100, which accounts for this rumor regarding the name.

On recommendation of the Canadian minister of railways and canals an order in council has been passed extending the courtesy of free passage through the dominion canals to all pleasure yachts attending the world's fair in 1893. The order goes into effect May 1.

The Gratwick, Smith & Fryer Lumber Company is quietly acquiring control of pine lands in the vicinity of Duluth. This company is said to have recently paid $150,000 for a tract in Lake county, Minn., north shore of Lake Superior, which was purchased from Arthur Hill.

Two tugs from Sault Ste. Marie, the Merrick and Wright, will assist steamers engaged in winter navigation on Lake Michigan. They will be stationed at Grand Haven, and in addition to keeping the harbor entrance clear of ice will have wrecking appliances aboard to be used in case of necessity.

Dunford & Alverson, owners of the big dry dock at Port Huron, have a large amount of repair work on hand, and the Jenks Ship Building Company will have three wooden steamers built for the lumber trade, for sale at the opening of navigation next spring. The engines for the boats are to be built by the Phœnix Iron Works, also of Port Huron.

Additional ore docks will be built at Two Harbors and Superior, for the expected increase in the ore traffic from the head of Lake Superior, on account of the opening of the Mesaba range, but as yet the extent of the improvements at either place is not definitely settled. Increased facilities for the handling and storage of coal at Duluth will also be provided before the opening of another season of navigation.

Bills & Koch, lumber dealers and vessel owners of Toledo, whose failure was announced last week, are said to have assets amounting to $103,000 as against liabilities that foot up $153,000. The new steel lumber carrier John B. Ketcham was the property of this company. The H. M. Loud & Sons Lumber Company of Oscoda, Mich., and the First National and Ketcham National banks of Toledo are the principal creditors.

Col. Jared Smith, United States engineer in charge of the Cleveland district, received proposals a few days ago from eight dredging concerns for dredging the straight channel at Toledo to cost about $100,000. G. H. Breyman & Bros. of Toledo were the lowest bidders, and Col. Smith has recommended that their bid be accepted by the war department. They agree to do the work at 12 cents per cubic yard, scow measurement, for the inner section, 14 cents for the turnout section and 16 cents for the outer section.

Iron Mining.

VALUE OF LEADING STOCKS.

Quoted by Chas. H. Potter & Co., No. 104 Superior St. Cleveland, O.

Stocks.	Par Value.	Bid.	Asked.
Cleveland-Cliffs Iron Company	$100 00	$.....	$ 57 00
Champion Iron Company	25 00	.....	42 50
Chandler Iron Company	25 00	.....	43 50
Jackson Iron Company	25 00	.....	.....
Lake Superior Iron Company	25 00	.....	37 00
Minnesota Iron Company	100 00	67 00	72 00
Pittsburgh & Lake Angeline Iron Co.	25 00	.....	140 00
Republic Iron Company	25 00	9 00	10 00
Ashland	25 00	.....	.....
Section Thirty-three	25 00	.....	4 00
Brotherton	25 00	2 00	2 50
Iron Belt	25 00	.....	2 00
Aurora	25 00	.....	9 00

Some Chicago stockholders in the Republic Iron Company, led by L. Z. Leiter, H. N. Holden, Joseph Austrian and others, and claiming to represent 25,000 shares of the stock, propose to oppose the policy of the management of the company in trying to transfer operations from the Republic mine to the Mesaba range. The Chicago stockholders have sent out a circular to all stockholders of the company soliciting proxies, and propose to ask at the meeting in Cleveland on Dec. 17 that action upon the question of a change in operations be postponed until such time as an expert can be sent to examine the Republic mine. They intimate that a better knowledge of the general condition of the company should be secured before the management is empowered to make the proposed change. It is probable that Cleveland stockholders who have important interests in this company will await an explanation of the condition of the mine at the meeting on the 14th inst. before forming an opinion as to the best course to pursue. Mining stocks generally are very dull. There has been some trading in Brotherton at about $2.50 in anticipation shortly of a dividend better than 50 cents a share. The mine shipped about 140,000 tons of ore from Ashland and Escanaba this year. Chandler will in all probability pay another regular dividend of $1 a share on Jan. 1, and Aurora is also expected to do something in the way of sharing earnings.

Several analyses have been made of the cargo of ore brought by the whaleback steamer Joseph L. Colby to Philadelphia from the mines of the Sigua Iron Company, Cuba. Andrew S. McCreath of Harrisburg, Pa., reported an analysis as follows: Metallic iron, 65.850; copper, 0.008; sulphur, 0.037; phosphorus, 0.015; alumnia, 0.081; lime, 0.0260; maguesia, 0.172; silica, 3.350 An analysis by the furnace receiving this cargo made from their own samples showed: Metallic iron, 66.61; phosphorus, 0.010. A portion of the same cargo also went to the Midvale Steel Company who report the following as their analysis: Metallic iron, 67.567; phosphorus, 0.014; sulphur, 0.026; alumina, 0.709; lime, 0.620; silica, 1.400; magnesia, 0.111. A second cargo of 2,400 tons, brought by the English steamship Torgorm, was also analyzed by Mr. McCreath of Harrisburg and showed 63.350 metallic iron and 0.014 phosphorus.

At Ashland, where the shipments for the season aggregated 2,227,406 gross tons, or 978,406 tons more than in 1890, the movement from the different mines was as follows: Anvill, 6,716 tons; Albany 8,171, Ashland 196,975, Aurora 295,012, Brotherton 95,132, Comet 25,420, Carey 33,766, Carey West 27,691, Campbell 8,417, Carpenter 97, Cromwell 43,016, Colby No. 2 57,513, Colby No. 1 6,232, Eureka 8,021, East Norrie 175,655, Hildreth 30,921, Iron Belt 160,618, Jack Pot 3,943, Mitchell 15,388, Montreal (south vein) 3,383, Montreal (north vein) 38,656, Norrie 423,237, Newport 94,708, Odanah 6,122, Pabst 50,495, Pearce 2,632, Palms 100,350, Rand 17,700, Sunday Lake 51,655, Section 33 (south vein) 10,430, Section 33 (north vein) 4,248, Tilden 233,355, Windsor 1,703. Some of the mines mentioned here have also shipped ore from Escanaba during the season.

Dispatches from Milwaukee report that Ferdinand Schlesinger has secured control of another good iron mine, the Aragon, Menominee range. Angus Smith of Milwaukee has been in charge of the property since it was opened under a lease five years ago. The product for three years has averaged above 150,000 tons. It is understood that Mr. Schlesinger and his associates have sub-leased the mine with an understanding that a small portion of the price of the lease will be paid in cash and the balance come out of the product.

At its Barnum mine the Cleveland-Cliffs will carry over about 80,000 tons of ore in stock. Evidently the hard ore mines have received a severe set-back this season. Managers of Cleveland-Cliffs are also talking of purchasing machinery for crushing the ore.

An aggregate output for the season of 353,142 gross tons is credited to the different mines of the Penn Iron Company, Menominee range, while the Aragon mine of the same range has shipped 166,000 tons..

Shipments of the different mines by lake from Escanaba, according to a report furnished from the dock office at that port, are as follows:

LAKE SUPERIOR MINES.

	Gross Tons.		Gross Tons.		Gross Tons.
Angeline	69,222	Foster	3,850	Republic	8,544
Barnum	4,045	Jackson	92,465	Salisbury	156,407
Buffalo	325,616	Lillie	7,250	Superior	265,951
Cambria	39,180	Lucy	13,109	Volunteer	52,929
Champion	836	Marquette	6,103	Winthrop	63,034
Cheshire	29,403	Negaunee	16,520	Northwest	1,687
Cleveland	161,416	New York	11,220		
Cliff's Sh'ft	28,093	Platt	2,676	Total	1,390,442
East N. Y.	30,886				

GOGEBIC MINES.

	Gross Tons.		Gross Tons.		Gross Tons.
Brotherton	14,541	Newport	9,963	Sun. Lake	2,615
Carey	43,524	Norrie	345,775	Windsor	12,373
Comet	4,799	Odanah	579		
Davis	20,910	Pabst	54,578	Total	510,951
Globe	1,594				

MENOMINEE RIVER MINES.

	Gross Tons.		Gross Tons.		Gross Tons.
Appleton	4,376	Florence	48,246	Millie	6,780
Aragon	124,165	Hemlock	44,648	Norway	44,849
Chapin	608,345	Hope	15,543	P'nt River	18,390
Ch'ry V'y	2,844	Iron River	1,176	Perkins	115,273
Claire	57,352	Keel R'ge	5,997	Pewabic	57,682
Com'n'w'h	239,859	Lamont	38,998	Shafer	45,008
Cundy	1,021	Lincoln	25,904	Sheridan	260,272
Cyclops	47,020	Mansfield	65,742		
Dunn	133,135	Mastodon	7,394	Total	2,107,507
Gt. West'n	87,487				

RECAPITULATION.

	Gross Tons.
Lake Superior mines	1,390,442
Gogebic mines	510,951
Menominee River mines	2,107,507
Grand Total	4,008,900

In General.

Ann Arbor No. 2 was launched from Craig's Toledo yard Wednesday and will be fitted out at once.

The freight passing through the Sault canal during the season ending Dec. 7, amounted to 11,241,000 tons, an increase of 2,325,000 tons over last season.

It is claimed that B. B. Inman, Duluth tug owner, will have a steel tug built by the American Steel Barge Company. Her engines will be 24 by 28 inches.

Plans for a twin screw steel steamer and for five light-ships, three of the latter for the lakes, are now being prepared by the light-house board. Lake builders will very probably get the greater portion if not all of this work.

A rudder stock and rudder forged in one piece and a stern post and shoe also forged in a single piece of steel were recently delivered at Chicago and will be exhibited at the fair. They are from the works of the Krupps in Germany.

In view of the advantages to be derived in the matter of insurance from classification under the rules of the American Shipmasters' Association, F. W. Wheeler & Co. will make alterations during the coming winter in the steel steamer W. H. Gilbert, so as to have the boat class with other steel steamers now being built by that company.

MARINE REVIEW.

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

JOHN M. MULROONEY, ... } PROPRIETORS.
F. M. BARTON, ... }
HOMER J. CARR, . . . Associate Editor and Manager Chicago Office, Western Union Building, 110 LaSalle Street.

Published every Thursday at No. 516 Perry-Payne Building, Cleveland, O.

The books of the United States treasury department contain the names of 3,600 vessels, measuring 1,154,870.38 tons in the lake trade. In classification of this fleet the lakes have more steamboats of 1,000 to 2,500 tons than the combined ownership of this class of vessels in all other sections of the country. The number of vessels of 1,000 to 2,500 tons on the lakes on June 30, 1891, was 310 and their aggregate gross tonnage 512,787.58; in all other parts of the country the number of this class of vessels was, on the same date, 213 and their gross tonnage 319,750.84. The classification of the entire lake fleet is as follows:

Class.	Number.	Tonnage.
Steam vessels	1,592	756,751.53
Sailing vessels	1,243	325,131.06
Canal boats	703	72,515.42
Barges	62	20,472.37
Total	3,600	1,154,870.38

Tonnage built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	No. of boats.	Net Tonnage.
1887	152	56,488.32
1888	222	101,102.87
1889	225	107,080.30
1890	218	108,515.00
1891	204	111,856.45
Total	1,021	485,042.94

St. Mary's Falls and Suez canal traffic: Number of boats through St. Mary's Falls canal in 1890, 228 days of navigation, 10,557; tonnage, net registered, 8,454,435. Number of boats through Suez canal during 1890, full year, 3,389; tonnage, net registered, 6,890,014. Number of boats through St. Mary's Falls canal in 1891, 225 days of navigation, 10,191; tonnage, net registered, 8,400,685. Number of boats through Suez canal during 1891, full year, 4,207; tonnage, net registered, 8,698,777.

Entered at Cleveland Post Office as Second-class Mail Matter.

PROBABLY not in the history of this country has a presidential message contained more facts of interest to citizens of the United States than that of President Harrison, submitted to congress on Tuesday of this week. In substance the president declares that on the lakes we have the greatest inland commerce on the globe and recommends immediate preparations for an outlet for this commerce through American territory to the seaboard. These statements from an executive head of the government who has experienced strained relations with Canada, on account of the policy of the dominion regarding its canals from the lakes to the Atlantic, should go a great way toward strengthening the movement on the lakes and throughout the northwest for an outlet for lake commerce from Buffalo to the seaboard. Beginning with statistics from the treasury department and from the eleventh census, showing that the vessel tonnage entered and cleared in the combined foreign trade of London and Liverpool is barely equal to the vessel tonnage passing through the Detroit river during 228 days of 1890, and very much below the freight tonnage in the coastwise trade throughout the lakes during the same year, the message presents a large amount of statistical information, calling attention to the wonderful growth of lake commerce. The controversy as to tolls upon the Welland canal is reviewed and the conclusion drawn that, notwithstanding the fact that the Canadian Pacific and other railway lines which parallel our northern boundary are sustained by commerce having either its origin or terminus, or both, in the United States, our treaty rights were flagrantly disregarded in this matter of canal tolls. The value of goods transported by rail between different points in the United States across Canadian territory probably amounts to $100,000,000 a year, and the message thus concludes upon this point:

"There is no disposition on the part of the people or government of the United States to interfere in the smallest degree with the political relations of Canada. That question is wholly with her own people. It is time for us, however, to consider whether, if the present state of things and trend of things is to continue, our interchanges upon lines of land transportation should not be put upon a different basis and our entire independence of Canadian canals and of the St. Lawrence as an outlet to the sea secured by the construction of an American canal around the falls of Niagara and the opening of ship communication between the great lakes and one of our own seaports. We should not hesitate to avail ourselves of our great natural trade advantages. We should withdraw the support which is given to the railroads and steamship lines of Canada by a traffic that properly belongs to us and no longer furnish the earnings which lighten the otherwise crushing weight of the enormous public subsidies that have been given to them. The subject of the power of the treasury to deal with this matter without further legislation has been under consideration, but circumstances have postponed a conclusion. It is probable that a consideration of the propriety of a modification or abrogation of the article of the treaty of Washington relating to the transit of goods in bond is involved in any complete solution of the question."

By supporting the retiring president at the last session in the policy here expressed, a Democratic congress has already given endorsement to this portion of the message, and it would seem as though this canal question between Canada and the United States is certain to develop into large proportions. Senator Hill, Democratic leader, is reported to be in favor of a ship canal from the lakes to the Hudson, and Senator Frye has already introduced a bill in the present session providing that the president may by proclamation suspend the right of carrying merchandise in bond through the United States provided for in the bill in case the dominion of Canada should at any time deprive the citizens of the United States of the use of canals in the dominion on terms of equality with Canada as provided by the twenty-fourth article of the treaty of Washington.

SECRETARY THOMPSON of the Duluth Chamber of Commerce, is an ardent and capable advocate of everything pertaining to the advancement of lake commerce, but we are of the opinion that his efforts to bring about another lake waterways convention in Washington during the holidays will not prove successful. As we have said before the time is hardly ripe for another such convention as that held in Detroit a year ago, and if a gathering entirely representative of the lake marine can not be held it would be far better to have no convention at all. Fortunately Mr. Thompson has as yet only asked for the views of various commercial bodies as to the advisability of holding such a convention. We hope the expression of opinions will be in favor of a postponement until next winter.

STEEL ship building in this country is yet in its infancy, but it is destined to be one of the greatest of the engineering industries of the United States. This is proven by the growth and excellent management of shipyards that have sprung up within a few years in response to a demand for vessels of war and for steel and iron merchant ships. The proposition to form a society of naval architects and marine engineers is therefore very appropriate, and the men in these professions who have not as yet signified their willingness to join this society should immediately take up a correspondence with Washington L. Capps, secretary, 1710 F street, N. W., Washington, D. C.

ST. MARY'S FALLS canal statistics for the present season will show lumber shipments from Lake Superior to Chicago, Buffalo and other lower lake ports amounting to about 525,000,000 feet. This represents an increase of 43 per cent. over the movement of lumber from Lake Superior last year. A few years ago there was practically no lumber shipped from Lake Superior. Vessel owners will do well in keeping an eye to the wonderful growth in this traffic.

THE supreme court of the United States has decided that the city and not the railway companies own the lake front at Chicago. This is a most important decision as it establishes a precedent for a great many other similar cases in lake cities.

Society of Naval Architects and Marine Engineers.

Letters of invitation to join the proposed Society of Naval Architects and Marine Engineers, now being sent by Secretary Washington L. Capps, assistant naval constructor at Washington, D. C., to prominent representatives of the ship building and shipping industries, give more definite information relative to the plans for preliminary organization. Among other things, the proposed constitution and by-laws, which will be definitely arranged at a meeting of the council to be held next month, provide:

That the object of the association shall be the promotion of ship building, commercial and naval.

In furtherance of this object annual meetings shall be held for the reading and discussion of appropriate papers and interchange of professional ideas, thus making it possible to combine the results of experience and research on the part of ship builders, marine engineers, naval officers, yachtsmen, and those skilled in producing the material from which ships are built and equipped.

The society shall consist of members, associates, juniors, honorary members and fellows. The class of members shall consist exclusively of naval architects and marine engineers, including professors of naval architecture or mechanical engineering in colleges of established reputation. A candidate for this class must be not less than twenty-five years of age and comply with the following regulations: He shall submit to the council a statement showing that he has been engaged in the practice of his profession in a responsible capacity for at least three years, and setting forth the grounds upon which he bases his claim to be considered a professional naval architect or marine engineer.

The class of associates shall consist of all persons who, by profession, occupation, or scientific attainments, are qualified to discuss the qualities of a ship and her propelling machinery, or the construction, manufacture, or arrangement of some part or parts of the hull or its equipment. Candidates for this class shall submit to the council a written statement of their professional qualifications for membership. If considered by three-fourths of the council present duly qualified for associate membership, their names shall be submitted to the society at its next meeting, to be voted upon by the members and associates.

The class of juniors shall consist of graduates of technical schools of established reputation, or persons who have had not lest than two years' practical experience in marine engine works or ship yards. Candidates must be at least eighteen years of age and certify their intention to continue in the profession and become naval architects or marine engineers. Juniors shall be eligible for transfer to the class of members after fulfilling the necessary conditions. The admission of juniors shall be by a favorable vote of three-fourths of the members of the council present. Juniors shall have no voice in the government of the society or admission of members.

The council may elect honorary members, the total number not to exceed twenty-five. They shall be persons of acknowledged eminence in their profession upon whom the council may see fit to confer an honorary distinction.

The class of fellows shall consist of those who are in sympathy with the development of naval architecture and marine engineering, and who shall contribute not less than two hundred dollars to a permanent fund for the advancement of the interests of the society. Fellows are eligible to membership, but have no voice in the government of the society unless they qualify as members or associates.

Members and associates will pay as an entrance fee to the society, $5, juniors $3, honorary members no fees, and fellows a donation of at least $200 to the permanent funds of the society.

In dues members and associates will pay $5, juniors $3, honorary members no dues, and fellows no dues.

Officers of the society shall consist of a president, vice presidents, members of council and a secretary and treasurer. The council may hold meetings subject to the call of the president, as often as the interests of the society may demand. The president shall have general supervision over the affairs of the society, appoint special committees, and preside at the annual general meetings. He shall be ex-officio member of all committees. The direct management of the society shall be vested in an executive committee composed of five members of council elected annually by the council, the president and secretary of the society being ex-officio members of the committee. At least three of the five members of the committee shall be members of the society. Matters of finance, arrangements for the reading of papers, etc., will be looked after by this committee, which will generally direct the affairs of the society. Special meetings may be called, and there shall be at least one annual general meeting for the reading and discussion of professional papers, election of officers for the ensuing year and the transaction of such other business as may be brought before it.

Personal Mention.

Mr. E. Platt Stratton, chief engineer surveyor for the American Shipmasters' Association of New York, is in West Bay City, looking after the construction of steel vessels now being built at the yard of F. W. Wheeler & Co., under the rules of this association.

William W. Bates, ex-commissioner of navigation, will own the copyright of the book relative to American shipping, upon which he has been engaged since leaving the treasury department. It is expected that the book, which will sell at $4, will be issued about Jan. 15 by Houghton, Mifflin & Co., Boston publishers. The work will contain nearly 500 pages of valuable information on a subject of vast importance, now very poorly comprehended.

Messrs. Alberger and Doran, representing Henry R. Worthington, of New York, were in Cleveland during the week. It is probable that a branch office for the sale of Worthington pumps and independent condensers, in connection with which Mr. Alberger is so well known, will be established in Cleveland. Mr. Doran, who is in charge of a very large part of the business of Henry R. Worthington outside of the main office in New York, and who shows a thorough knowledge of the latest practice in marine engineering in Great Britain as well as this country, is a son of James Doran, the eminent superintending engineer of the International Steam Navigation Company.

Sinclair Stuart, surveyor for the United States Standard Steamship Owners', Builders' and Underwriters' Association, has just returned to New York after a visit to the lakes in the interest of a meeting to be held in New York on the 19th inst. by the association which he represents. This association is endeavoring to extend its classification to steel steamers on the lakes, and with that end in view has invited ship owners and ship builders to attend the meeting in New York, free of expense, when an effort will be made to formulate special rules for the lakes. Mr. Stuart says that Edward Gaskin, superintendent of the Union Dry Dock Company, Buffalo, and George F. Williams, formerly with F. W. Wheeler & Co., West Bay City, will be surveyors for his association on the lakes.

In a communication to the Marine Journal of New York, Thos. Drein & Son of Wilmington, Del., say: "In the Journal of Nov. 12, the statement of second officer Perkins, of the Mallory line steamship Concho, of picking up nine men on a life raft, goes to show what an important life saving device a life raft is. That a good lookout is kept on the Mallory steamers, the above and following fact prove: One of their steamers picked up a life raft in mid-ocean with the name plates of Thomas Drein & Son. This raft had two men on it of the ill-fated Holland, a gunboat, which sank in collision some four years ago. You, no doubt, remember the wreck of the gunboat, as many lives were lost and nothing found of the vessel but broken boats. Two other steamers were lost in the same storm, and both fitted out in New York. Our raft was the only thing found of the two vessels. Our English cousins are catching on to life rafts, as we have fitted out five of the transatlantic ocean steamers lately, and have many inquiries for more rafts for foreign steamships."

Marine Engine Design.

Written for the Marine Review by W. F. Durand, Principal of graduate school of marine engineering and naval architecture, Sibley College, Cornell University.

We have next to derive the value of m. e. p. from the boiler pressure and expansions assumed. A gauge pressure of 160 lbs. equals 174.7 lbs. absolute pressure The final pressure in the L. P. cylinder should be about 12 lbs. absolute. This corresponds to 14.56 expansions. If this be taken as the value of r in the common formula:

$$\text{mean forward pressure} = p\,\frac{(1 + \text{hyp. log. } r)}{r}$$

$$\text{we should have m. f. p.} = \frac{174.7 \times 3.68}{14.56} = 44.1$$

As a matter of fact, however, the m. f. p. realized in any given engine would fall far short of this amount. This loss is due to two causes. The effect of clearance, and the loss in pressure due to the resistance of the passages and pipes, and the consequent drop in pressure between the boiler and engine, and between the successive cylinders of the latter, as previously referred to. The loss due to both causes, even in well designed engines, may aggregate about 25 per cent., so that instead of 44.1 m. f. p. we should not expect to realize more than about three-quarters of this or say 33 lbs. The mean back pressure will be about 3 lbs. leaving 30 lbs. as the value of the m. e. p.

In connection with the estimation of the probable m. e. p., having given the boiler pressure, the following table will be useful. It is computed for a final pressure in all cases of 12 lbs., and assumes a loss of one-quarter, with 3 lbs. back pressure as explained above:

Gauge Pressure.	Absolute Pressure.	Probable mean Forward Pressure.	Probable mean Effective Pressure.
140	154.7	31.9	28.9
145	159.7	32.3	29.3
150	164.7	32.5	29.5
155	169.7	32.8	29.8
160	174.7	33.	30.
165	179.7	33.3	30.3
170	184.7	33.5	30.5
175	189.7	33.8	30.8
180	194.7	34.1	31.1
185	199.7	34.3	31.3
190	204.7	34.5	31.5
195	209.7	34.7	31.7
200	214.7	34.9	31.9

Inserting the various values into the I. H. P. formula and solving for A we have

$$A = \frac{33{,}000 \times 1{,}500}{2 \times 30 \times 3.5 \times 100} = 2{,}357 \text{ square inches.}$$

The corresponding diameter is 53.6 inches for L. P. cylinder. We may next find the suitable diameter of H. P. cylinder. To this end we fix upon the desired number of expansions in this cylinder, which in its present case we may take as 2. It follows that the number of expansions between the high, and end of the low pressure cylinders is 7.28, and hence the area of the H. P. will be $2357 \div 7.28 = 324$. The corresponding diameter is 20.3 inches.

For the determination of the diameter of I. P. cylinder we shall assume the 7.28 expansions noted above to be divided into two equal steps. The ratio between the areas of the L. P. and I. P. will therefore be as $\sqrt{7.28}$ to 1, or as 2.7 to 1. Therefore area of I. P. cylinder $= 2{,}357 \div 2.7 = 873$. The corresponding diameter is 33.3 inches.

We have therefore as the general dimensions of the engine 53.6″, 33.3″ and 20.3″ diameter by 42″ stroke. After reaching such values we have to take the nearest practical shop dimensions. These may be taken to the nearest quarter or half inch. We may also note that no allowance has been made for the reduction in the area of the piston rod. If therefore we take say the nearest half above, the error will lie in the opposite direction and the requirements will be practically fulfilled. We take then 54″ 33½″ and 20½″ as the diameters of the cylinders.

EQUALIZATION OF WORK AMONG THE CYLINDERS.

Equality of work means in general equality of turning moment on the three cranks, and a just division of the total stress between the three portions of the engine as a whole. It is also true in general that the arrangement for best thermodynamic efficiency is usually one which will give a nearly equal sub-division of the work. The problem of adjusting the amount of work among the various cylinders, in the case of a new design requires the laying down of the probable indicator cards, and the adjustment of the I. P. and L. P. cut-offs to effect the equalization desired. It must be remembered that the positions of these cut-offs have but slight influence on the power of the engine as a whole. The H. P. cut-off determines the amount of steam which enters per stroke, while the other cut-offs only effect the way in which it is utilized. In general an earlier cut-off in the I. P. or L. P. cylinders results in more work from such cylinder, and a later cut-off, *vice versa*.

In order to lay down the probable indicator cards, we should require a knowledge of the clearance and receiver volumes, the angular relations of the cranks, and combined with all an element which can only be derived from experience. Every theoretical card is more ore less modified in the engine itself due to friction through passages, condensation, re-evaporation etc., in a way which is simply beyond the reach of any exact analysis. Nevertheless by a careful estimate of the influences at work, cards may be laid down which shall not be far wrong, and from which the equalization of power may be effected with all necessary accuracy.

The operation itself is, however, long and tedious, and is beyond the limits of our available space.

If the I. P. and L. P. cylinders are provided with variable expansion valves, the work may be equalized approximately for any given set of conditions. If the link is the only expansion apparatus, the adjustment may usually be effected, but it may require such excessive linking up as to result in a sacrifice in the smooth running of the engine. Under such conditions, it is better to run smoothly, even at a sacrifice of the equalization of the work.

In the case of the design at present before us, the points of cut off in I. P. and L. P. cylinders must remain undetermined so far as they depend on the laying down of the cards of three cylinders—at least for the present. A valve of from ⅔ to ¾ with appropriate values of the clearance and receiver volumes, would be found, however, to give a fair equalization of the work among the cylinders.

From this point on, the design of a marine engine is concerned with the various details, their sizes, forms, ratios, etc., each one of which must be settled in the light of various opposing considerations. The points bearing on some of the more important of these, may be made the subject of an article at a future time.

CHICAGO LAKE INTERESTS.

WESTERN OFFICE, MARINE REVIEW,
No. 13 Western Union Building, CHICAGO, Ill., Dec. 8.

The Chicago underwriters who are attending the Detroit meeting this week, went there with the finest lot of chaotic plans for the reorganization of Inland Lloyds, that could have been gathered. In fact, they did not know what to do, and if the deliberations result in something definite and practicable, the Chicago insurance men will come back well satisfied. It is possible that an attempt will be made to remove Inland Lloyd's to this city. The reasons which will be urged for this movement will be that Buffalo is not the best place for the Lloyds, because of the predominance of one general insurance agency there. The objection against Cleveland will be that ship builders and vessel owners have too much direct influence. It will be urged in behalf of Chicago that insurance business here is so divided between general agencies that out of the conflicting interests might come absolute impartiality. Still it may be that the reorganized vessel inspection will have its headquarters in Detroit, on account of that city being the half-way place. Detroit is certainly preferable to Buffalo, looking at the question from the standpoint of Chicago.

The war on smoking Chicago tugs has broken out again, and a large number of suits have been instituted against tugs on account of making smoke. There has been plenty of bark in this warfare, but no one has yet been bitten. In other words, none of the monumental fines imposed on smoking tugs have ever been collected.

Kingston Notes.

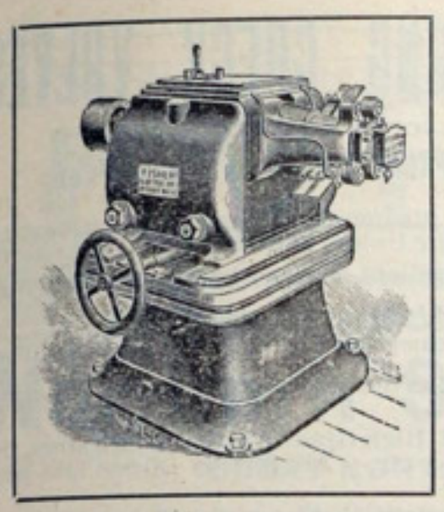
Special Correspondence to the MARINE REVIEW.

KINGSTON, Ont., Dec. 8.—The steamers Tilley and Rosedale had a race down from Fort William, and notwithstanding that the former had a barge in tow she arrived here two hours before the latter. The Tilley has made the trip mentioned in seven and a half days and from Duluth here in eight and a half.

Already this year W. W. Ogilvie of Montreal has received 1,354,000 bushels of the Manitoba wheat crop of 1892. This is the largest portion of any one crop received by any one firm in Montreal.

Next week Capt. John Gaskin leaves for Ireland to make arrangements for the construction of the Montreal Transportation Company's new steel steamer.

The steamer Algonquin will receive a new iron stern here this winter.



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JAMES PICKANDS, Cleveland, O. President Minnesota Steamship Co.	Four Steel Freight Steamers
HARVEY H. BROWN, Cleveland, O. Brown Steamship Co. and Lake Superior Iron Co.	Five Steel Freight Steamers
SAMUEL MATHER, Cleveland, O. President Huron Barge Co.	One Steel Freight Steamer
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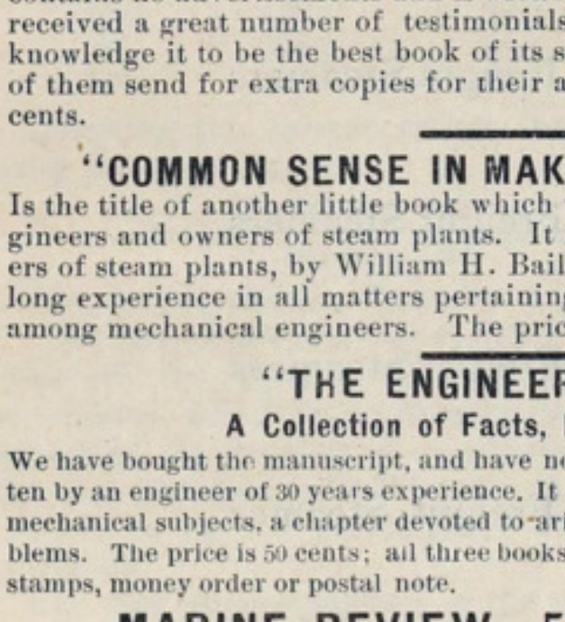

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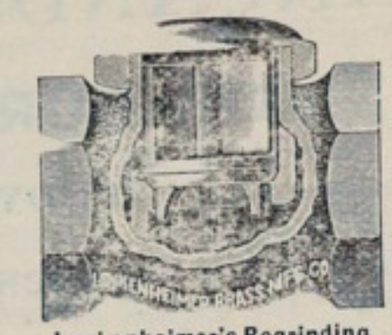

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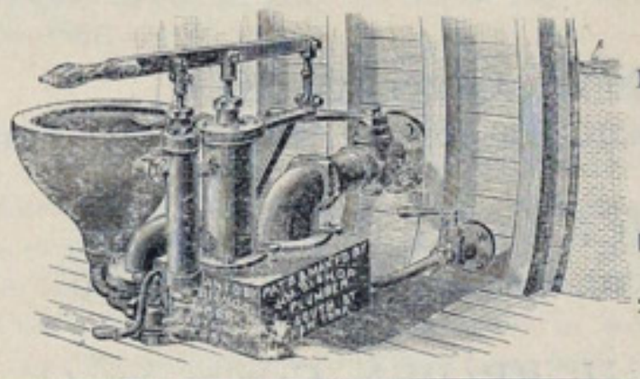

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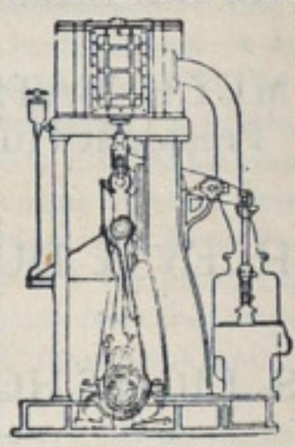

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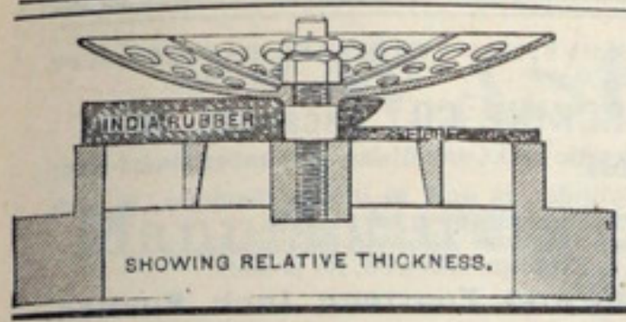

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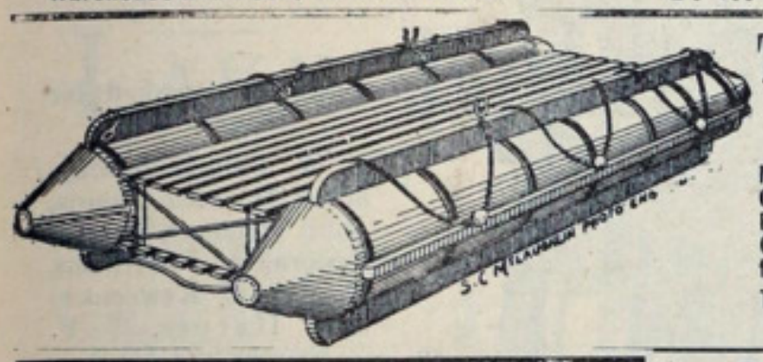

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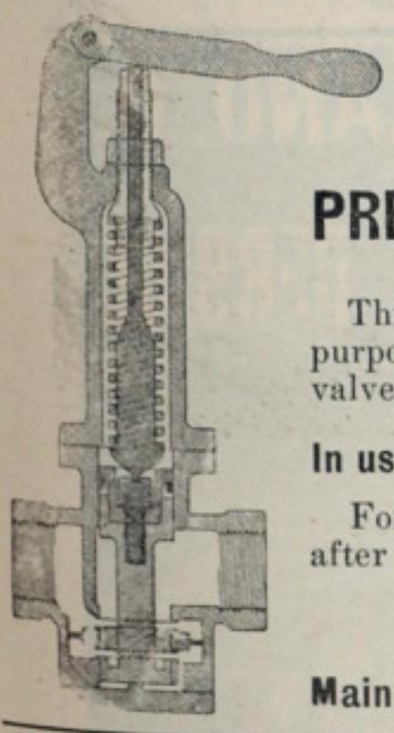

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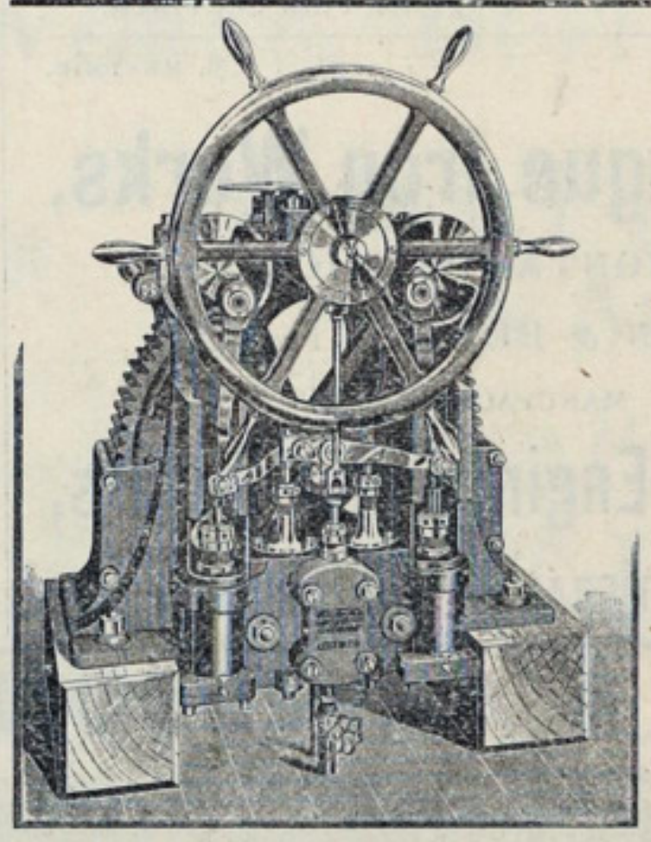

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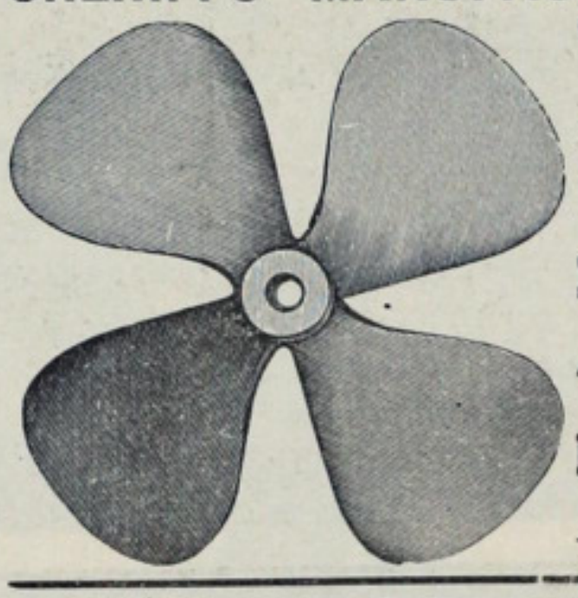

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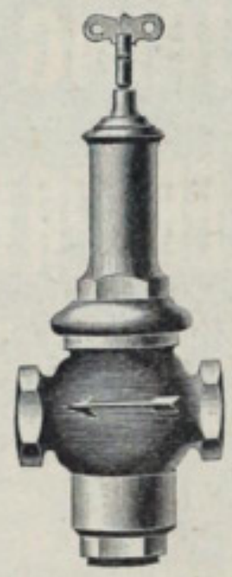

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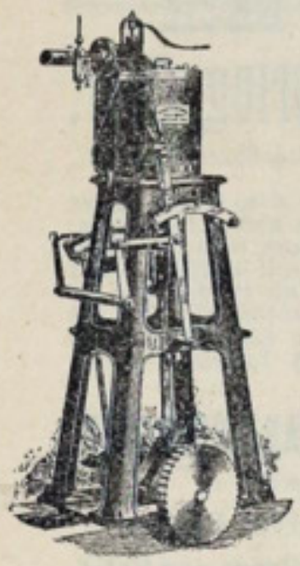

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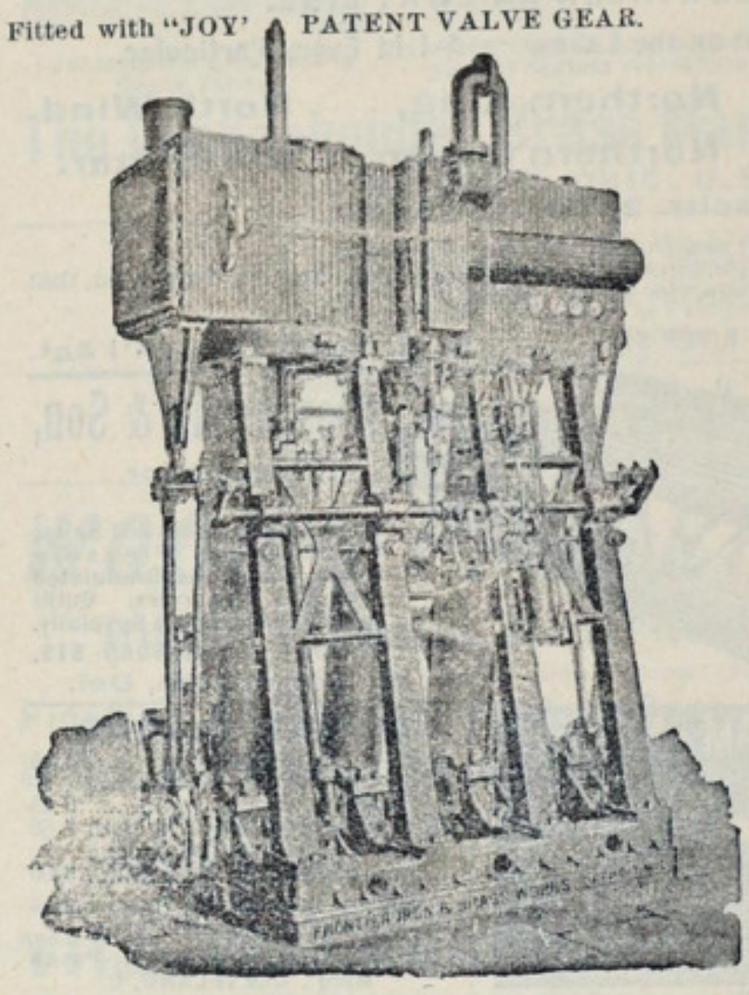

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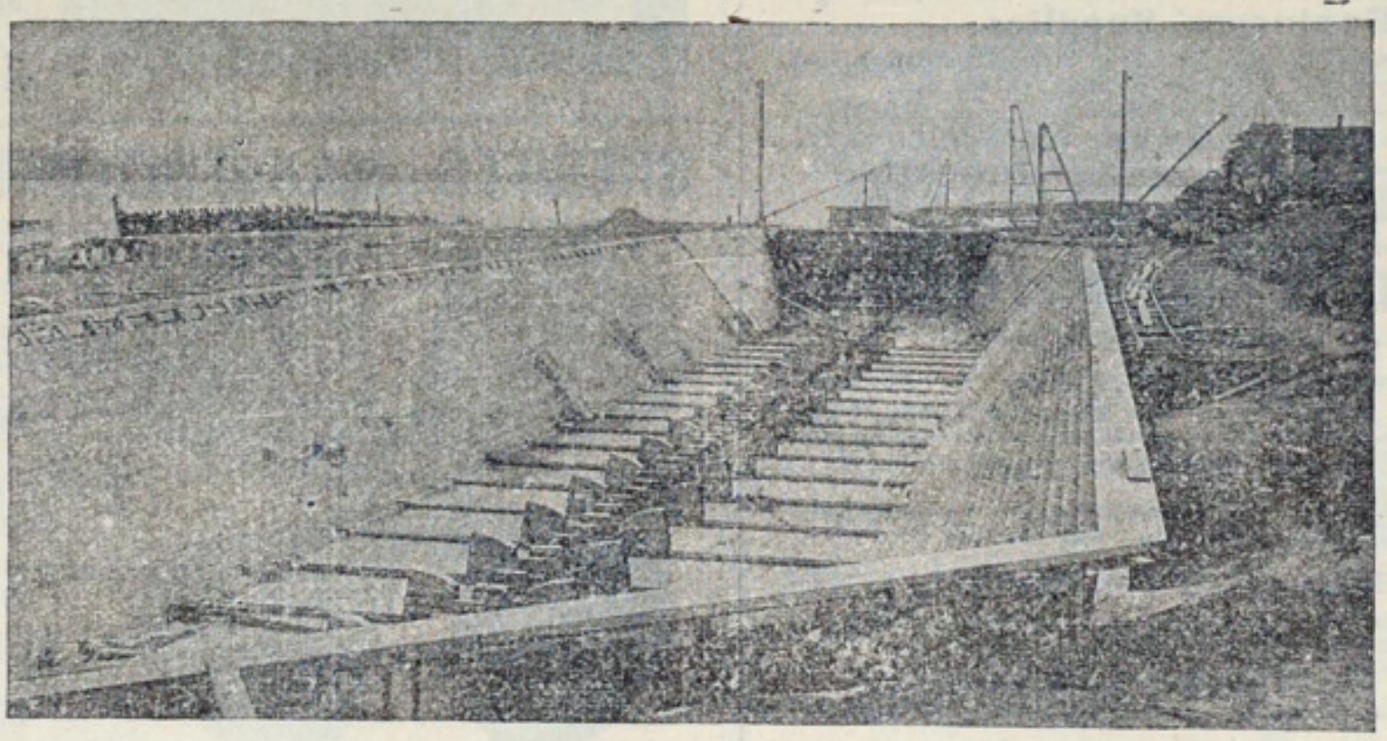

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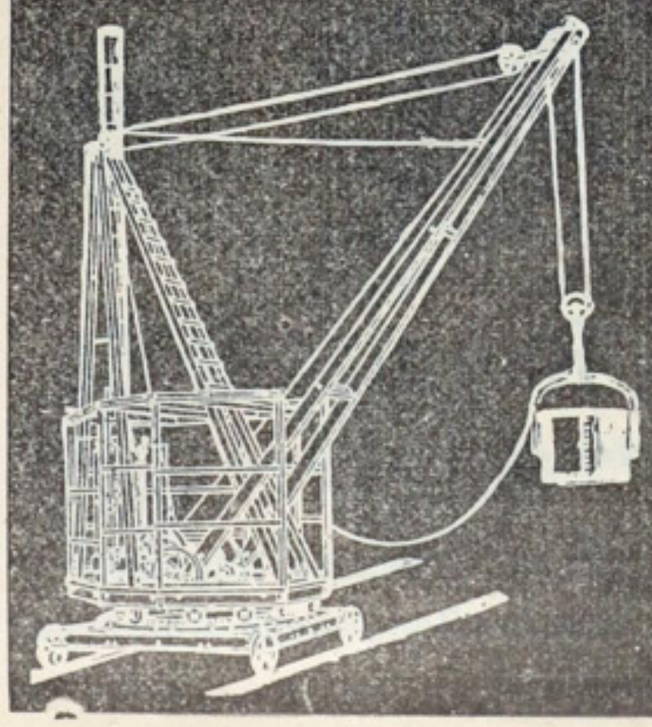

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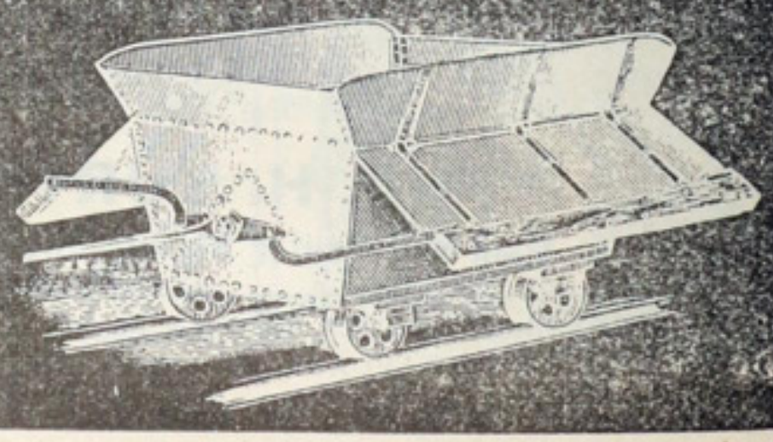

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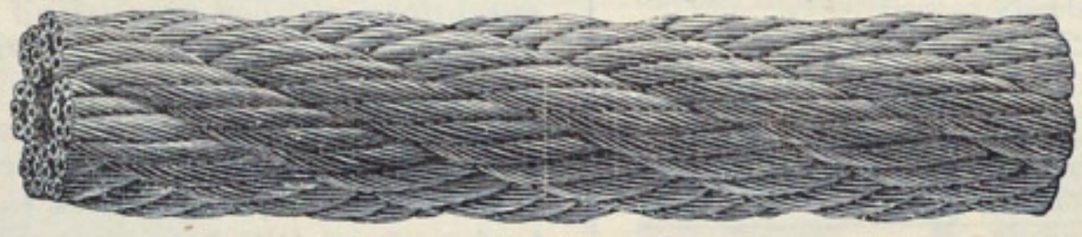

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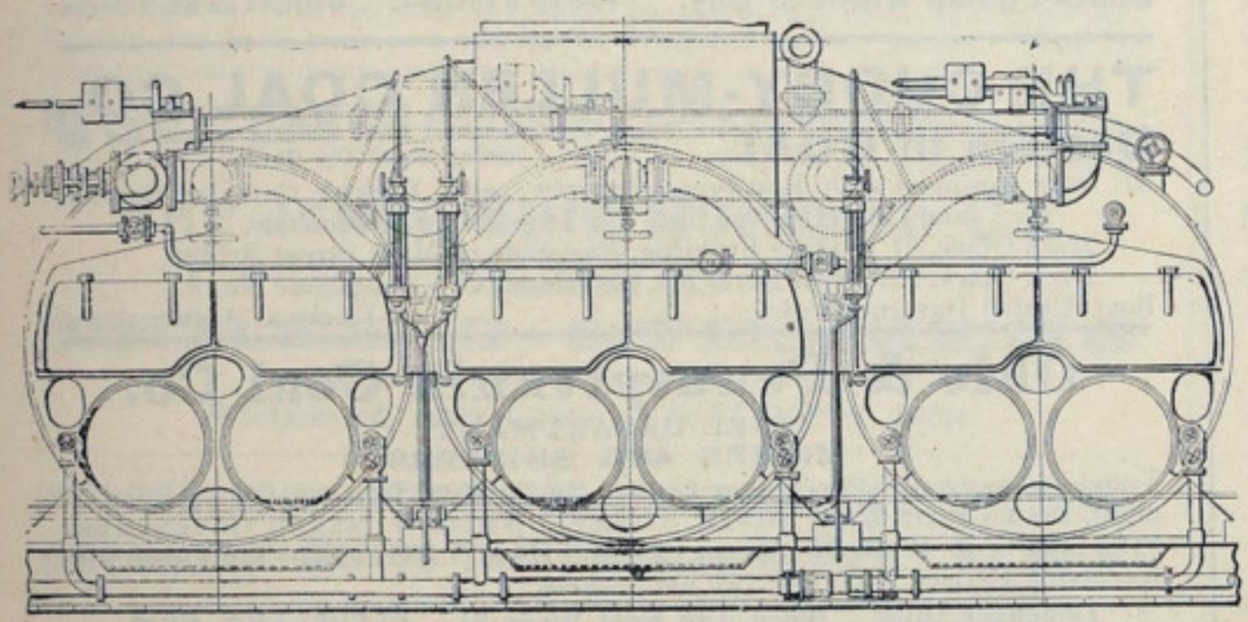

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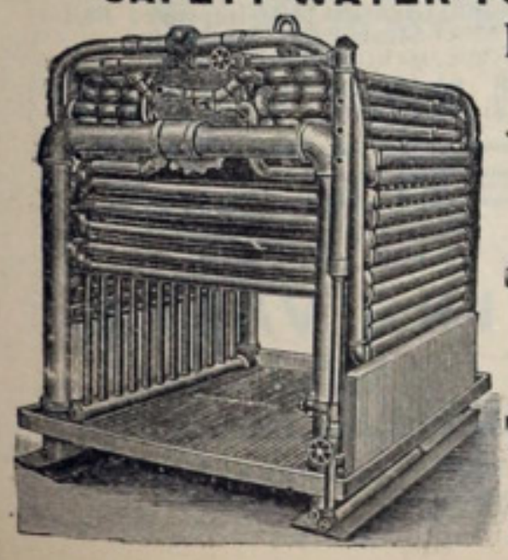

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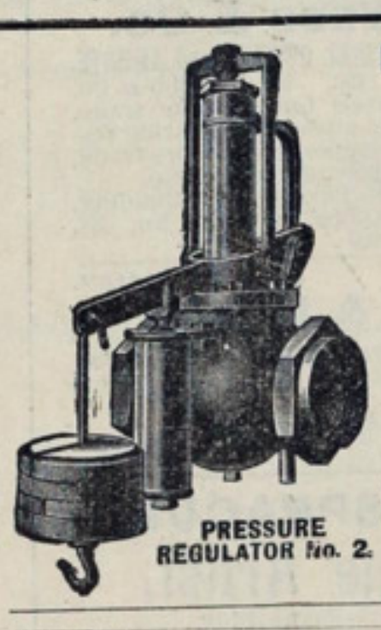

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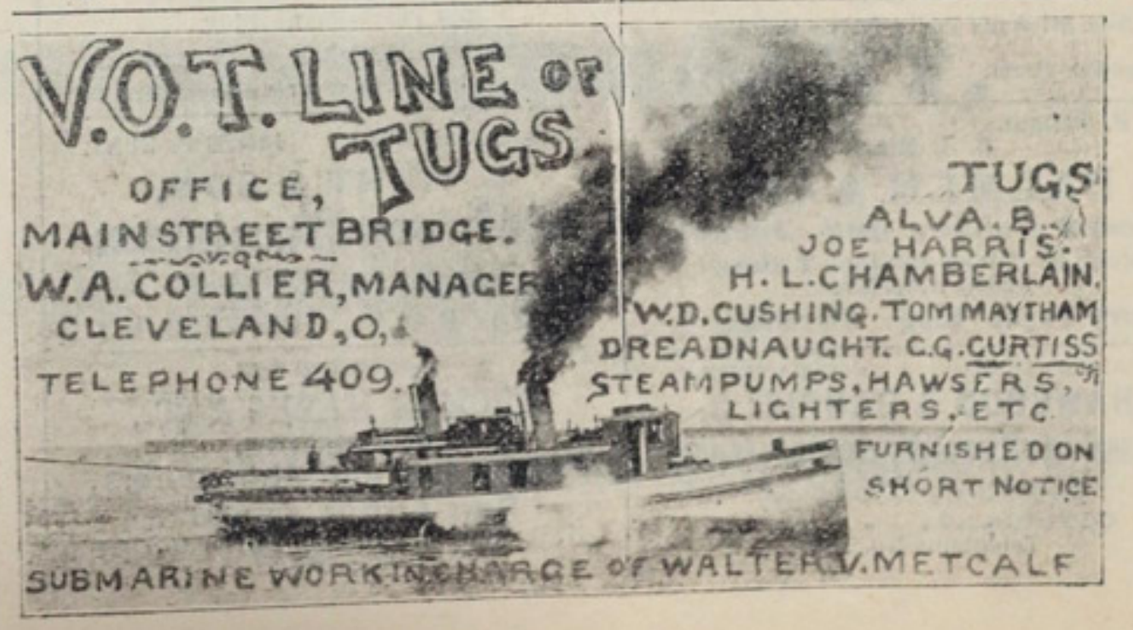

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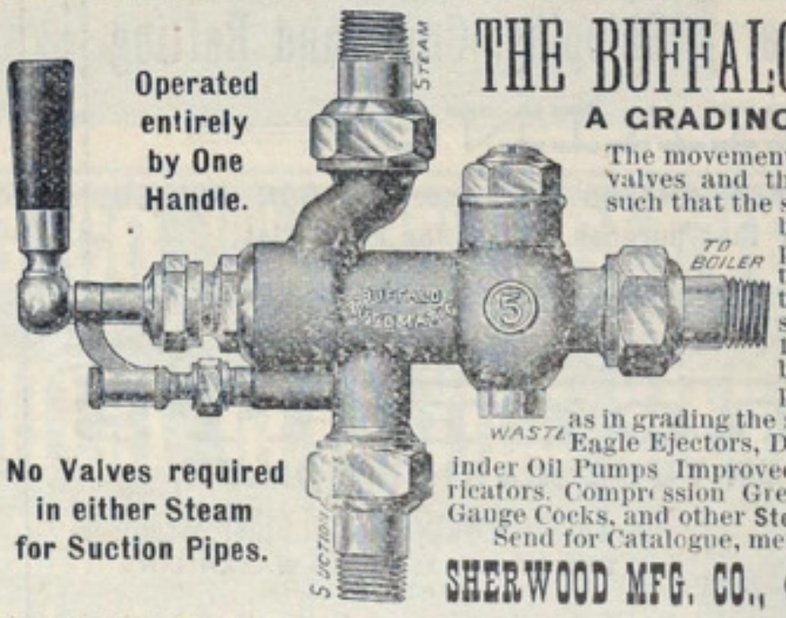

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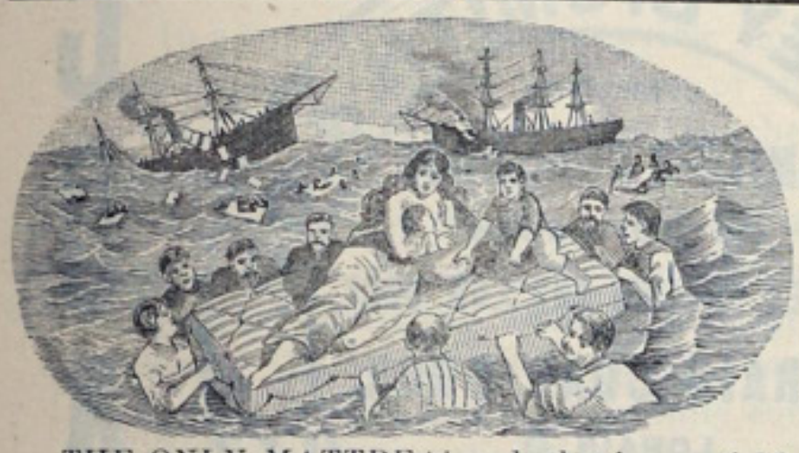

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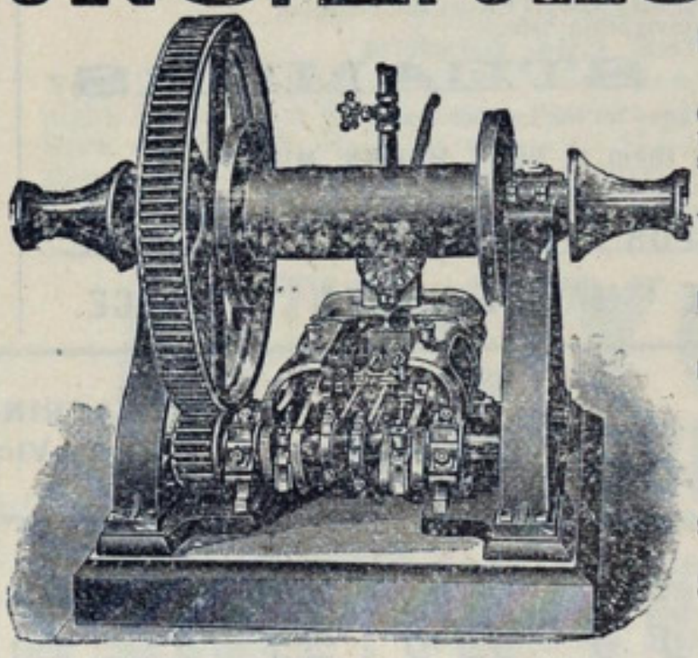

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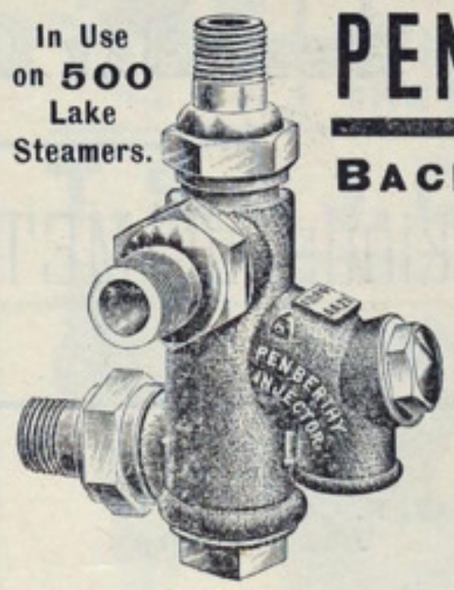

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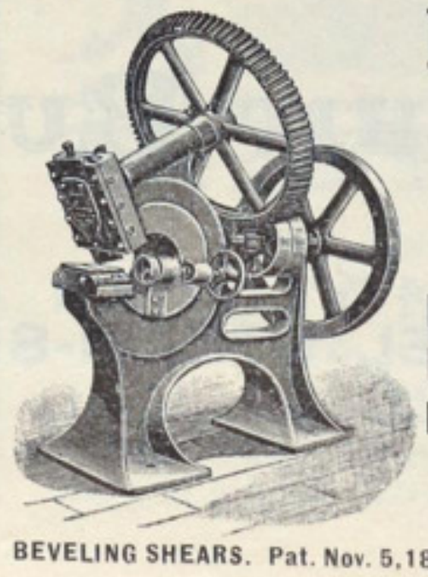

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